The Growth of *Arabidopsis thaliana* Facilitated by Microbe Interaction

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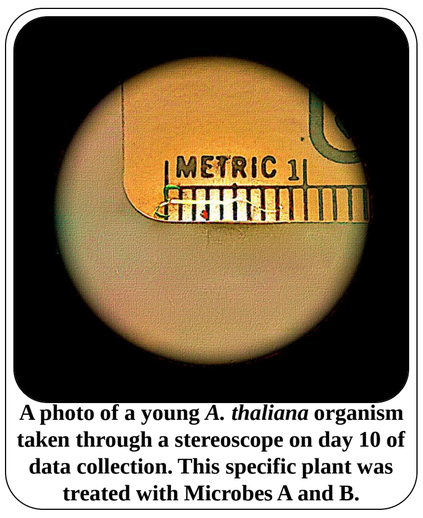
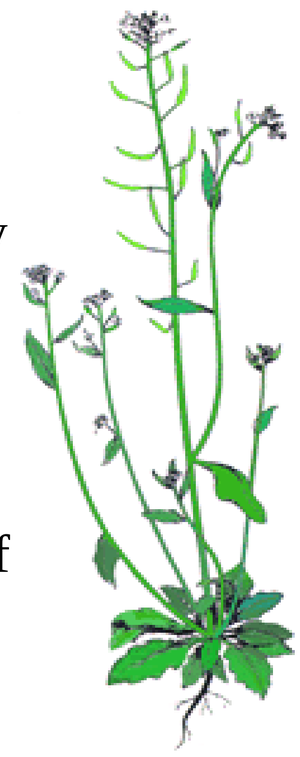
Hypothesis: The presence of microorganisms will facilitate the germination and growth of *Arabidopsis thaliana.*



A photo of a young *A. thaliana* organism taken through a stereoscope on day 10 of data collection. This specific plant was treated with Microbes A and B.

Background: *Arabidopsis thaliana* is a small flowering model plant, often used for biological research because of its life cycle characteristics.[1] Microorganisms are used in the planting industry to liberate nutrients that impact the growth of plants. Therefore, the presence of microorganisms will facilitate the germination and growth of *A. thaliana*. This hypothesis was tested from data collected over a ten day study of the effects soil microbes have on root length, and the likelihood of a seed germinating with soil microbes.



A. thaliana

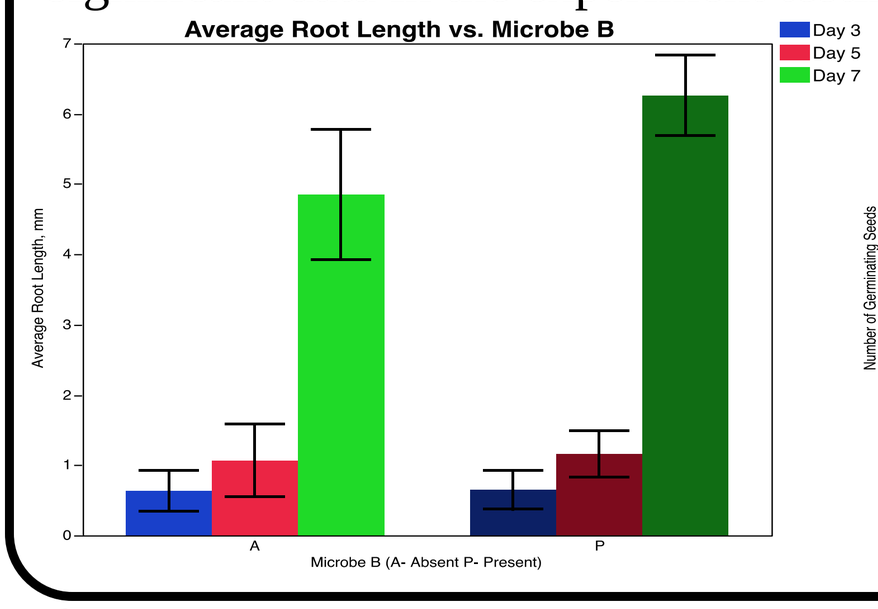
Test	Soil Microbes
Test 1	Control (No)
Test 2	A
Test 3	B
Test 4	A+B

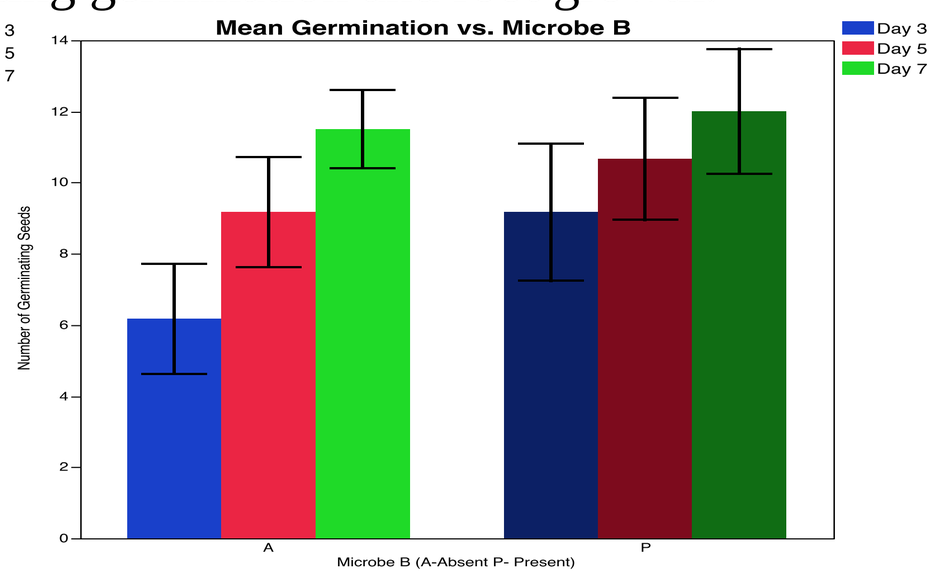
Methods: *Arabidopsis thaliana* seeds were rinsed in a ten percent bleach solution prior to stratification. Soil microbes were added to the designated dish according to the test. The agar was enhanced with murashige skoog (plant nutrients for growth). Fifteen seeds were planted per dish and stored at 20° C for 16 hours with light, and 18° C for 8 hours without light daily. Seeds germinating per dish (12 dishes) and root length collected daily. The data was then analyzed for trends.

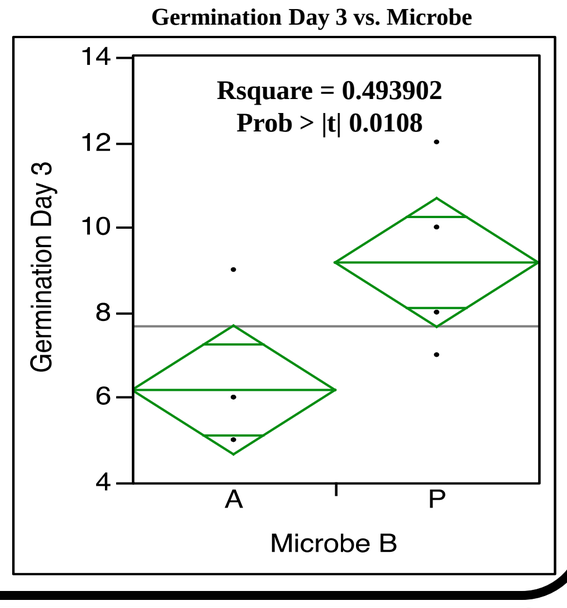
Pilot study on soil microbe interactions:
Early experiments show that a community of soil bacteria is critical to preventing the overgrowth of soil fungi.

Earlier Studies	No Soil Microbes	Soil Microbes
Unautoclaved Soil	NO MOLD	NO MOLD
Autoclaved Soil	MOLD	MOLD

Results: In the presence of soil microbes *A. thaliana* showed no statistically significant trends regarding germination or root growth. The two bar graphs below show how the difference is not significant between the presence of Microbe B on each day. The final chart shows a one way analysis of an Anova test showing that the presence of Microbe B increased the germination quantity on day 3.[2] This was the most statistically significant data in the experiment testing germination and root growth.







Conclusion: After ten days of controlled plant and microbial facilitated growth, the analysis of the data showed no statistically significant results. *Arabidopsis thaliana*, although showed signs of Microbe growth facilitation, did not calculate into conclusive trends. This study could be repeated with a larger sample size for improved data collection.

Resources:

[1]"TAIR - About Arabidopsis." *TAIR - About Arabidopsis*. N.p., 1998. Web. 21 Nov. 2013.
[2]JMP®, Version *10*. SAS Institute Inc., Cary, NC, 1989-2007.